DOCUMENT RESUME

ED 171 126 FL 010 297

AUTHOR Dromi, Esther
TITLE The Use of Locative Prepositions by Hebrew Speaking Children 2:0 - 3:0 Years Old. Kansas Working Papers in Linguistics, Volume 3.
INSTITUTION Kansas Univ., Lawrence. Dept. of Linguistics.
PUB DATE Jun 78
NOTE 19p.

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Child Language; Function Words; *Grammar; *Hebrew; *Language Development; Language Processing; *Language Research; *Linguistic Competence; Linguistic Theory; Morphology (Languages); Perceptual Development; Preschool Children; Psycholinguistics; Semantics; *Speech Communication; Verbal Communication
IDENTIFIERS *Prepositions

ABSTRACT

The use of locative prepositions in the spontaneous speech of 30 Hebrew speaking children two to three years old was studied. The rank order of locative prepositions is determined according to the correct use in obligatory contexts, and tentative conclusions are drawn concerning the order of acquisition of these terms in Hebrew. An attempt is made to examine the role of cognitive complexity and formal linguistic complexity in determining that order. Special reference is made to the form of this expression in Hebrew, and the following hypotheses are proposed: (1) prefixed locatives are more salient for children than whole word prepositional locatives, and (2) morphological complexity is a determinant factor in the acquisition of new forms. Out of a total of 4,294 spontaneous utterances, only 439 utterances contained obligatory contexts for locative prepositions. The children supplied the expected prepositions in all but 49 of these. The Hebrew data show that not only correct productions increase with mean length of utterance (MLU), but so does the total number of obligatory contexts for locative prepositions. The data support the assumption that children require semantic coherence and that they try to look for a one-to-one mapping between ideas and linguistic units. No consistent preference for one preposition over another was found. Enclitic prefixed prepositions seems to be acquired before full word prepositions that share the same locative notions, and morphological complexity seemed to act as a determinant in the acquisition of locative prepositions in Hebrew. (SW)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

THE USE OF LOCATIVE PREPOSITIONS BY HEBREW SPEAKING CHILDREN 2:0 - 3:0 YEARS OLD*

Esther (Etti) Dromi

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Linguistics Graduate Student Assoc.
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

ED171126

Introduction

Cross-linguistic data suggest that children begin to express locative notions at the beginning of the multi-word level with no overt linguistic markers. Only later when they reach Stage II as described by Brown (1973) or at the age of 2:0 - 3:0 do they begin to use explicit marker systems for mapping the underlying notions of location onto surface utterances (Brown, 1973; Slobin, 1973; Clark and Clark, 1977).

Languages differ in the grammatical means of mapping underlying notions. For this reason researchers expect to find differences in the order and rate of acquisition of terms that are used to express a specific content domain (Slobin, 1973; Johnston and Slobin, 1977).

The goal of the present inquiry is to look at the use of locative adpositions among 30 Hebrew speaking children aged 2:0-3:0. An attempt is made to determine the order of acquisition of these terms and to draw tentative conclusions as to the role of cognitive complexity and linguistic complexity in determining this order.

Theoretical Background

In the last few years several studies consider the question of the acquisition or use of locative expressions by young children. In most of these studies the way children treat locative terms provide the researchers with clues as to the processes involved in the acquisition of natural languages. These studies can be classified according to different general concerns or hypotheses about the predominant variables which determine the language development course.

The relation between the cognitive complexity of locative terms and the order of acquisition has been studied by Antinucci and Parisi (1970), H. Clark (1973), and H. Grimm (1975). The main claim of these researchers is that the child acquires linguistic devices by learning how to apply them to the a priori knowledge he has previously learned about the world. Parisi and Antinucci (1970) showed that the accuracy of children's motor responses to instructions containing locatives depends on the complexity of the spatial relations that these terms represent. Thus the children deal much more accurately with topological terms such as 'in' and 'on' than with locatives of dimensional space such as 'in front of,' 'below,' and 'beside,' or of complex spatial relations, such as 'through' or 'along.' In his paper, "Space, Time, Semantics, and the Child," H. Clark (1973) specified the cognitive complexity of locative expressions according to properties such as position in space (positive

FL010297

direction unmarked, negative direction marked) directionality (location is unmarked, direction is marked) and the number of dimensions of the reference points (one-dimensional prepositions are unmarked, two- and three-dimensional ones marked). (See H. Clark, 1973, Table 2, page 4) Although it is difficult to examine empirically the application of the complexity hypothesis to child language, Clark argues that the order of acquisition should be determined by the cognitive complexity. Grimm (1975) studied the spontaneously produced prepositional phrases of 137 German children aged 2:7-7:0. On the basis of her data on frequency of use, order of emergence, and types of substitutions, she concluded that "The development of spatial prepositions concurs with the development of spatio-geometric properties shown by Piaget" (Grimm, 1975:97). Grimm suggested that spatial prepositions are the first to emerge in child language and that these prepositions are followed by temporal and purely syntactic prepositions.

The nature of non-linguistic strategies that are involved in the acquisitions of word meaning has been studied by using stimuli with spatial prepositions such as 'in,' 'on,' and 'under' (E. Clark, 1973; Grieve, Hoogenraad and Murry, 1977:271). In these studies the way children respond to the investigator's instructions provided clues as to the processes of acquisition of these terms as well as to the general role of non-linguistic strategies which the children use before manifesting full linguistic competence. The order of acquisition of spatial terms by English-speaking children suggested by these studies is 'in,' 'on,' and 'under,' respectively. Grieve says that "normally there is a period when the child understands 'in,' 'on' but not yet 'under'" (Grieve, et al.).

A third group of studies provides data on the emergence of specific adpositions in child language. Brown (1973) discusses the acquisition curve of the prepositions 'in' and 'on' of his three subjects and noted an abrupt rise to criterion at the beginning of Stage II when almost all uses of 'in' and 'on' were correct. He observed that these prepositions seemed at this stage to be used for spatial and concrete purposes. Brown found that in the acquisition of the 14 grammatical morphemes by his English-speaking subjects the prepositions 'in' and 'on' both fell second in the ranked order.

de Villiers and de Villers (1973) confirmed Brown's findings. In a cross-sectional study, they examined the order of acquisition of the same 14 grammatical morphemes that were discussed by Brown (1973), with a group of 21 English-speaking children age 1:4-3:4. They found a high correlation between their results and Brown's. In their rank order, the prepositions 'in' and 'on' are acquired early and following each other (de Villiers and de Villiers, 1973).

The use of locative expressions in several languages was studied by Slobin (1973) and Johnston and Slobin (1977), who tested the role of the 'formal linguistic complexity' of these terms in the process of their acquisition. Slobin (1973) suggested that analyses of cross-linguistic discrepancies in the development of terms used to express identical underlying notions would provide evidence for specific operating principles

that children use in the process of acquiring their first language. Such studies would enable one to examine the extent to which various phonetic, morphological and semantic properties facilitates or impedes the acquisition process.

Johnston and Slobin (1977) used a wide range of tests in order to study the comprehension and production of locative expression in four different languages: English, Turkish, Serbo Croation and Italian. The investigators found that in all four languages, children at the early age of 2:0-2:8 use no more than two or three different prepositions and that children in each successively older age group produced more locatives than those in the previous group. It was only subsequently, between the ages of 2:8-4:0, that a significant difference emerged in the number of locative expressions produced by children learning Turkish or Italian and those learning English or Serbo Croation. In all four languages the first four locative expressions to be produced were 'in,' 'on,' 'under,' and 'beside.' English, Turkish and Italian children acquired the locatives in the predictable order (in, on, under, beside) while Yugoslav children's performance was marginally predictable (on, in, beside, under). By applying six criteria to specify the formal linguistic complexity of locative expressions in the four languages, the investigators showed that wherever cognitive complexity fails to predict the order of acquisition, linguistic processing determines that order.

As different languages make different combinations of the possible determinants of order of acquisition, it was suggested by Brown (1973) and by Slobin (1973) that in order to work out the determinants of acquisition order, it is useful to look at comparative data. Since Brown (1973:294) wrote "not much information is now available on order in other languages and what there is seldom utilizes an explicit criterion of acquisition...," several studies on languages other than English have been published. For example, Macwhinney (1976) studied the acquisition of morphology and syntax in Hungarian. Lipp (1977) discussed the acquisition of Estonian inflections. In both studies Cazden's (1968) criterion for determining the acquisition of new forms, i.e. 90% correct use in obligatory context was applied, and it proved to be generally applicable to other languages than English.

In the present study I will examine the use of locative prepositions in the spontaneous speech of Hebrew speaking children. The rank order of locative prepositions will be determined according to the correct use in obligatory contexts. Tentative conclusions will be drawn concerning the order of acquisition of these terms in Hebrew.

An attempt will be made to examine the role of cognitive complexity and formal linguistic complexity, in determining that order. Special reference will be made to the form of this expression in Hebrew, and I will propose the following hypotheses: (i) prefixed locatives are more salient for children than whole word prepositional locatives, (ii) morphological complexity is a determinant factor in the acquisition of new forms.

Locative Prepositions in Hebrew

The means for mapping underlying notions that specify a relation between an object and its location is the concern of this study. In Hebrew such relations are expressed with prepositions. Prepositions constitute a restricted set of items which perform a variety of functions. I shall not discuss prepositions that serve as purely syntactic markers or prepositions that serve only as markers for grammatical case relations. Rather, I shall discuss the use of prepositions that contain independent semantic content. All locative relations are marked in spoken Hebrew by prepositions. They always precede the reference point, but they differ in form. We can classify the prepositions into 3 groups according to form.

A. Enclitic Prefixes - bound morphemes attached directly to the noun.

(1) be[2] - 'in'
oto - 'car, automobile'
beoto - 'in a car'

These prefixes are attached enclitically to the following noun with which they form a single phonolgoical unit (in terms of stress, vowel alternations on the prefix etc.). As bound morphemes they never occur in isolation. These prefixes incorporate the definite marker ha- as follows:

(2) beoto 'in (a) car'; be-+ha-oto =baoto 'in the car'
leyeled 'to (a) boy'; le-+ha-yeled=la yeled 'to the boy.'

B. Separate Word Prepositions - Morphemes that are represented in the orthography as separate words, and which are not affected by the initial element or elements of the word which they precede.

(3) al 'on' al gag 'on (a) roof'; al hagag 'on the roof'
im 'with' im yeled 'with a boy'; im hayeled 'with the boy'

The contrast between (A) and (B) is manifested clearly in two prepositionals which under certain syntactic and semantic constraints, can take either an enclitic or separate word form, thus:

(4) le- (Prefix) alternates with el (Free Morpheme) in the sense of 'to'

leyeled ~ el yeled 'to a boy'
layeled ~ el hayeled 'to the boy'

C. Fused forms - These occur whenever a preposition is followed by a pronoun rather than by a full noun or noun phrase. In such cases the combination of preposition + pronoun is fused into a single form. Thus:

(5)	le-	+hu	'to'	+	'he'	=	lo	'to him/it (masc)'
	le-	+hi	'to'	+	'she'	=	la	'to her/it (fem)'
	be-	+ani	'in'	+	'I'	=	bi	'in me'
	be-	+hi	'in'	+	'she'	=	ba	'in her/it (fem)'
	al-	+hu	'on'	+	'he'	=	alav	'on him/it (masc)'
	al	+hem	'on'	+	'they'	=	alehem	'on them'

The precise form taken by these fusings differs from one preposition to another. It is assumed that these forms have to be learned as idiosyncratic properties of a particular preposition. Thus, for instance, the object marker et changes to ot before pronominal suffixes and the preposition im 'with' changes to it before pronominal suffixes.

(6)	et dan	'OM Dan'	*et hu	'OM he'	-	oto
	im dan	'with Dan'	*im hu	'with he'	-	ito

In regard to the development of locative prepositions in Hebrew, I am especially interested in looking at the contrast between prefixes and separate word prepositions. The fact that children can use two forms with the same meaning interchangeably seems to facilitate the analysis of the data and to justify some arguments. The acquisition of the fused forms will also be discussed. It is necessary to find out whether the structural complexity of these forms has a crucial effect on the order of acquisition.

The Study

Speech samples from thirty Hebrew speaking children aged 2:0-3:0 were elicited, transcribed, and analyzed. These samples were obtained in the course of a larger study of Israeli children's speech production at this age (Dromi, 1977). The subjects had all been born on "kibbutz" (collective villages) and used Hebrew as their first and only language. These children have spent their lives mainly in a peer-group situation of the so called "children's home," spending two to three hours each day with their parents. After an initial pilot-study to test the effectiveness of various techniques of elicitation, a set of pictures and small plastic toys were used to elicit spontaneous utterances from the children. The researcher tried to avoid engaging in conversations with the subjects and talked mainly when she introduced a new set of stimuli, then she would say, "Oh! what a nice picture I have!..." Each stimulus was presented to the child for 30 seconds; if the child did not respond the stimulus was changed. Whenever the child produced an oral response, the experimenter would repeat it using an "echolalic" type of imitation. This imitation included intonation, misarticulated sounds, and morpho-syntactic errors. This procedure was followed in order to help the experimenter to interpret and then transcribe the utterances. It proved to be effective, especially with the younger subjects. The sessions, each of which lasted 30-50 minutes, were recorded by a portable cassette recorder, Sony T.C. 95. During the sessions, contextual information was

noted down as part of the written record. All utterances were transcribed following each session. Speech samples varied in size from 50 to 220 utterances for each child with a mean of 113 utterances and a total of 4,294 utterances. MLU values were calculated on the basis of an original model for calculating MLU in Hebrew,[3] they ranged from 1.5 to 5.8.

For the purpose of the present study, I considered for analysis only the spontaneous utterances of each child. Neither imitative utterances (when a child reproduced the experimenter's repetition) nor responses to question (those usually were rare and did not refer to the stimuli) were analyzed. The spontaneous utterances of each child were scored for the frequency with which the child supplied obligatory contexts for locative prepositions, and for the proportion of the contexts in which the prepositions were present where required.

Obligatory contexts for each prepositions were defined according to Brown's (1973) suggestions. Because I was dealing with a restricted set of items, and as the procedure of elicitation did not allow linguistic prior contexts, I determined the obligatory contexts on the basis of two criteria:

a. Linguistic Contexts - The child's own utterance. Whenever the child omitted a preposition and it was clear that a specific preposition was needed, i.e.:

(7) *hayeled yošev hasir šelo
the child sit(s) the toilet his
'The child is sitting his toilet'
instead of:
hayeled yošev al hasir šelo
the child sit(s) on the toilet his
'The child is sitting on his toilet'

(8) *dubi nofel maim
(a) teddy fall(s) (a) water
'A teddy is falling a water'
instead of:
dubi nofel la maim
(a) teddy fall(s) to the water
'A teddy is falling into the water'

Whenever the child substituted an appropriate preposition with a different one which did not fit the meaning of the sentence.

(9) *hu medaber al hatelephon
he talk(s) on the phone
'He is talking on the phone.'
instead of:
hu medaber ba telephon
he talk(s) in the phone
'He is talking in the phone.'

(10) *hu mashke lapraxim
he gives water to the flowers
'He is giving water to the flowers'
instead of:
hu mashke et hapraxim
he give(s) water the flowers
'he is giving water on the flowers'

b. Non-linguistic Contexts of the Speech Situation - Here I made the decision mainly on the basis of the stimuli that were presented to the child and the motor manipulations of the child concurrently with the utterance, i.e.,

When the child was talking about a specific picture that described a child approaching a dog, and he said:

(11) *hine yeled holex hakeley
here (a) child go(es) the dog
'Here is a child going the dog'
instead of:
hine yeled holex lakelev
here (a) child go(es) to the dog
'Here is a child going towards the dog'

Or when the child put a doll in a crib and said:

(12) *po buba mita
here (a) doll (a) bed
'Here is a doll a bed'
instead of:
po buba bamita
here (a) doll in the bed
'Here is a doll in the bed:

It should be noted here that the 'rich interpretation' procedure was applied only for those utterances that included clear locative intention. Utterances such as buba agala 'baby crib' or cova yeled 'hat boy' which could be interpreted in several ways were not identified as utterances which supplied obligatory contexts for prepositions.

Results

Out of a total of 4,294 spontaneous utterances studied (Dromi, 1977), only 439 utterances contained obligatory contexts for locative prepositions. The children supplied the expected prepositions in all but 49 of these.

Table I represents the Hebrew locative prepositions which were manifested in 439 spontaneous utterances of 30 2:0-3:0 year old Israelis, along with a simplified description of their means and examples for different correct uses.

	Preposition	Differential Semantic Features	Examples
1.	be- 'in, at' ba- 'in, at + Def. Marker'	[+ internal - directional]	a. position within hakadur bakufsa 'the ball is in the box' b. end result of an action sim bakufsa 'put[4] it in the box' c. presence with closeness to hu babank 'he is at the bank' lehitraot barvox 'see you in the street'
2.	betox 'in, inside' literally 'in the inside of'	[+ internal - directional + surrounded]	a. position within hakadur betox hakufsa 'the ball is in the box' b. end result of an action sim betox hakufsa 'put it in the box' c. position within and surrounded by hu betox habait 'he is inside the house' hu betox hayaar 'he is inside the forest'
3.	el 'to'	[+ directional + goal]	a. movement towards hayeled ratz el habait 'the boy runs towards the house' hayeled rotze el ima 'the child wants to go to his mother' hu yotzo el hakvish 'he goes to the street'
4.	le- 'to, into, for' la- 'to, into + Def. Marker'	[+ directional + goal (+ dative)]	a. movement towards hayeled ratz labait 'the boy runs towards the house' b. transfer to animate recipient hu zorek kadur layalda 'he throws a ball to the girl' c. marks the beneficiary hu kona ledan sefer 'he buys a book for Dan'
5.	li 'to+pronominal suffixes' lo lahem	[+ directional + goal + dative]	a. the same as (4)b and c fused with pronominal suffixes hu zorek la kadur 'he throws to her the ball' hu kone lahem sefer 'he buys for them a book'
6.	al 'on'	[- internal - directional + contiguous + high]	a. on top and in touch with hu yošev al hagag 'he sits on the roof' hu yošev al aba šelo 'he sits on his father's lap' b. end result of an action sim al hašulxan 'put it on the table'
7.	mi- 'from, off' me-	[+ directional - goal]	a. movement away from ne nafal mehagag 'it fell off the roof' b. transfer away from hu lakax midani 'he took from dani' hu lakax mehaspriya 'he took from the library'
8.	al yad 'near, beside, next to'	[- internal - directional - contiguous]	a. position close to al yad dani 'beside dani' al yad habank 'next to the bank' al yad habait 'near the house' b. end result of an action sim al yad habait 'put it near the house'
9.	meaxorey 'behind, in the back of'	[- internal - directional - front]	a. position to the rear of hu omed meaxorey habank 'he stands behind the bank' b. end result on action sim meaxorey hakufsa 'put it behind the box'
10.	mitaxat le 'under below, beneath' literally 'from the bottom of'	[- internal - directional - high]	a. position lower to haet mitaxat lasefer 'the pen is under the book' hu mitaxat laggan 'he is under the roof' b. end result of an action sim mitaxat lašulxan 'put it under the table'

Table 1: Hebrew locative prepositions in our sample.

I described the semantic properties of the prepositions in terms of the following binary markers [± internal] [± directional] [± goal] [± contiguous] [± high] [± front]. (In this binary system [- directional] means [+ stationary], [- high] means [+ low], etc.

The system is not adopted from any other study and it includes only those features that would help the reader to grasp the meaning differences expressed by the prepositions.

Table 2 shows the number of obligatory contexts for each preposition supplied by each child. All values are presented in absolute numbers. Figures given without parentheses indicate the number of correct uses in obligatory contexts. Numbers in parentheses indicate the incorrect use of a preposition; that is to say, all instances in which the child omitted this preposition or substituted another preposition for it.

Table 2 reveals the following trends:

1. The number of different locative prepositionals seems related to the level of MLU. In the same stimuli conditions a greater variety of prepositions is used by children with higher MLUs. This correlation is independent of the sample size, as the overall correlation between the number of utterances for each child and his MLU is not significant ($r = 0.297$ $p > 0.05$).

Note that in general, children with low MLU's produced only a limited number of utterances with locative intentions. In view of the fact that such children in general failed to make overt reference to spatial relations, it was impossible to determine obligatory contexts for prepositions with these subjects. For example, when a low MLU child was presented with a picture of a baby in a crib, the child might say "A baby and a crib" or simply "A baby" and hence no obligatory context could be counted in such instances.

2. On the assumption that cross-sectional studies can predict the sequence of acquisition (de Villiers and de Villiers, 1973), I suggest that Table 2 represents the sequence of acquisition of locative prepositions in Hebrew. We can see that each preposition shows limited use in the early stages (i.e., when the child has a low MLU), and that only later - as MLU increases - is there a rise in the frequency of use of each preposition. This trend is best shown by the increase in frequency of the prepositions al 'on' and le- 'direction to,' reading from left to right on the table.

In Table 3 prepositions are ranked according to the overall frequency of obligatory contexts for the group as a whole. The first column shows obligatory contexts, the second shows number of correct uses, the third column shows the proportion of correct uses for each preposition, the fourth column shows the relative frequency within the locative prepositions.

Subject No.	38	30	19	9	28	14	5	25	4	7	16	21	11	37	15	20	2	17	23	13	26	32	35	27	34	3	36	33	18	12
Age	2:7	2:1	2:11	2:3	2:0	2:9	2:7	2:8	2:8	2:3	2:2	3:0	2:9	2:5	2:2	3:0	2:6	2:11	2:10	2:10	2:7	2:6	2:7	2:6	2:9	2:5	2:3	2:8	2:10	2:
MLU	1.6	1.9	2.0	2.3	2.4	2.5	2.7	2.7	3.0	3.0	3.1	3.1	3.2	3.2	3.5	3.5	3.6	3.7	3.7	3.8	3.8	3.8	3.9	4.0	4.1	4.1	4.2	4.7	5.2	5.
be- ba- 'in, at'	2 (2)	4	1	2	4 (3)	2 (1)	2	3	2	9 (2)		3	4	2	9 (1)	3 (1)	2	3 (1)	5	6 (3)	4 (3)	6	8	1	9	3	3	5 (1)	3	9 (3
al 'on'	2				2				1	(2)	(1)	(1)		(1)	9 (3)	(1)	2 (1)			3 (2)	4 (2)	4 (2)	1		3		7 (1)	3	4	4
el 'to'		1										1							1				2							
li lo lahem 'to' + pronominal suffixes'			3	1	2	1	5	3	1	1	10	6	2		5	4	3	3	7	4	5	5	2	12	5	2	5	3	5	6
mi- me- 'from, off'		(1)	2	(1)				1	1	1	2 (1)			4	1	1 (1)	(1)	1	(1)	2						1 (1)		1		
le- la- 'to' ('transfer to animate dative')			2	3	1	3	3	2	(1)	(1)		1	1	5	2				4 (2)	1	3	2	6	1	2	1	3		4	
le- la- 'to' ('movement towards')								1		(1)		1	1			1		3		2	1	3 (1)	2	5	3		1		(1)	6 (1
meaxorey 'behind, in back of'								1																						
al-yad 'beside along'															2 (2)												1			
betox 'inside, in'																					1				1		1	1		
mitaxat 'under'																														1

Table 2. Frequency of occurrence of each preposition for each child. The table is ranked according to MLU values (N +30)

Preposition	Obligatory Contexts	Correct Uses	Correct Uses/ Oblig. Contexts	Relative Frequency of Oblig. Contexts (Percentage)
1. be- ba- 'in, at'	139	118	0.85	31.7
2. li lo la 'to + pronominal suffixes'	111	111	1.00	25.3
3. le- la- 'to' (transfer to animate & dative)	60	49	0.82	13.7
4. al 'on'	54	50	0.93	12.3
5. le- la- 'to' (movement towards)	34	30	0.88	7.7
6. me- mi- 'from, off'	25	18	0.72	5.7
7. el 'to'	5	5	1.00	1.1
8. al yad 'beside, near'	5	3	0.60	1.1
9. betox 'inside'	4	4	1.00	0.9
10. meaxorey 'behind, in back of'	1	1	1.00	0.2
11. mitaxat 'under, below, beneath'	1	1	1.00	0.2
	439	390		100.0

Table 3: Use of locatives by the group as a whole (N = 30)

Tables 2 and 3 show that:

1. The prepositional be- ba- 'in, at the' was used by all subjects, including those with the lowest MLU (1.6).

2. The fused forms with the dative marker le- were used by all children but one (subject no. 37) with an MLU of 2.0 or more. Almost all children used this form only with singular pronominal suffixes (e.g., li 'to me' lo 'to him' la 'to her'). Only subject No. 27 (MLU 4.0) who used this form more frequently than other subjects in our study, used it 3 times with plural pronominal suffixes (e.g., lahem 'to them', lanu 'to us').

3. The use of the preposition le- 'to' combined with an animate noun is the third more frequent preposition. Most of the children used this preposition more than once in different contexts. 10 subjects in our sample (Subjects no. 9, 28, 14, 4, 16, 37, 15, 23, 3) used it only in that sense (e.g., leima 'to mommy' layeled 'to the boy' ledany 'to Danny') and never used it to express movement towards location (e.g. lebait 'to a house' lasade 'to the field' lavoda 'to the work').

4. If we disregard the formal differences between the use of the preposition le- prefixed to a regular (animate) noun and "fused" with a pronominal suffix (i.e., ledani 'to Danny' and lo 'to him respectively), then the preposition le- 'to' in its dative use is shown to have the highest frequency of occurrence.

5. The locative preposition al 'on' ranked the fourth in the order of acquisition. In our sample only when MLU values exceeded 3.0 (subject No. 7), or even 3.5 (subject No. 15) did the children begin to use this preposition more frequently. This suggests that in Hebrew the two prepositions be- 'in, at' and al 'on' do not appear at the same time and that al is acquired relatively late.

6. The locative preposition le- in the sense of direction toward a place is far more common than its synonymous full word form el. The full word preposition was used only by 4 of our subjects and 3 of those used it only in one instance. Table 2 does not represent a specific trend in the development of this preposition. The prefix le- (direction) is acquired relatively late. Children with MLU values of under 3.5 used it only rarely. Subject No. 23 (MLU 3.7) used the full word el when he referred to direction and the prefix le- only in the restricted sense with relation to an animate goal. This clear distinction between form and function is of interest and will be considered in the next section.

7. The preposition mi- me- 'from' does not seem to manifest a clear trend. Most of the children used it only once, so it is quite difficult to examine its productive use. It seems as though the use of this preposition has no predictive value as to the use of other prepositions by the child.

8. The remaining locative prepositions, all of which share a certain formal or morphological complexity, were produced rarely and only by few children with relatively high MLU values. We can tentatively conclude that the locative prepositions that contain three distinct morphemes such as, mitaxat le- 'under' literally, "from-bottom to", al-yad 'beside, next to' literally, 'on hand (of)'; betox 'inside', literally, 'in

center of'; are infrequently produced by Hebrew speaking children 2:0-3:0 and are probably acquired considerably late.

Discussion

It is important to note here that this study is based on the analysis of spontaneous speech samples and, hence, only the production, and not the comprehension of the children is considered. As this study is a cross-sectional study, all the assumptions regarding the order of acquisition and possible determinants of this order are tentative and should be re-examined in a longitudinal study as well.

The Hebrew data show that not only correct productions increase with MLU but so does the total number of obligatory contexts for locative prepositions. Brown (1973) noted that a short time before reaching criterion (i.e. 90% of correct use in obligatory contexts), Adam, Eve, and Sara omitted the prepositions 'in' and 'on' but supplied many utterances in which there were obligatory contexts for these prepositions. This suggests that the technique of determining obligatory contexts can be taken as a predictive measurement for the acquisition of new forms.

The Hebrew data do not seem to fully conform with Brown's findings concerning his three English speaking subjects. According to Brown (1973:330)."'in' and 'on' are always the first prepositions learned and always learned together." In Hebrew, the locatives be- ba- 'in/at' and and le- la- 'to' (which preceeds an animate goal) are the two earliest prepositions to be acquired; al 'on' is ranked fourth in the suggested order of acquisition. It is clear that 'in' and 'on' are not acquired concurrently in Hebrew. (see Tables 2 and 3) A very similar course of development for locative inflections was proposed by Lipp (1977) for Estonian. Macwhinney (1976), who studied the acquisition of cases in Hungarian, suggested that the first locative inflections in Hungarian that reach 90% criterion are those which express motion towards a goal.

The discrepancy between the acquisition of the earliest two prepositions in English and Hebrew might be explained on the basis of perceptual properties. I suggest that not only post-verbal particles facilitate acquisition as Slobin (1973) argued, but also prefixes are more salient for the child than full word prepositions. This assumption is supported by the data of this study in which locative directional le- was far more common than its synonymous full word form el; be- 'in, at' was the common manner of expressing 'location internal to,' while the children rarely used betox, the separate word for 'inside', and while several occurrences of the prefix mi-me 'from' are recorded not one instance of min, the separate word of this preposition occurred.

The many factors that are involved here need to be investigated further. We must consider acoustical and phonological differences between prefixes and full word prepositions, differences in morphological complexity, differences in the semantic complexity (i.e., homonymity and synonymity), differences in the frequency in parental speech, as well as differences in the linguistic contexts in which adults use each form.

Slobin's (1973:191) principle: "Pay attention to the ends of words"

could be invoked to explain the early and frequent use of the "fused" forms. It is possible that although these forms are relatively more complex formally, they are more salient for the child, as they always appear in a fixed position at the end of the utterance.

Our data support the assumption that children require semantic coherence and that they try to look for a one-to-one mapping between ideas and linguistic units (Slobin, 1973). It is possible that in the process of acquisition of complex forms such as the "fused" forms and double meaning prepositions in Hebrew, children go into a stage in which the form is produced only in restricted function. For example, children who used fused forms of le- 'to' only combined with singular pronominal suffixes, or other children who used le- only in its dative function. Slobin's (1973:207) principle: "Errors in choice of functor are always within the given functor class" was found to be accurate for our data.

For example:

(13) (i) hi omedet al hayalda hazot
she stands (Fem) on the girl the this
'she is standing on this girl'

The subject used al 'on' instead of al yad 'beside, next to'.

(ii) ex hu yošev baricpa?
how he sits in the floor
'How is he sitting in the floor?'

The child used ba- 'in the' instead of al ha- 'on the' in an otherwise well-formed question.

(iii) hayeled medaber al hatelefon
the boy talks on the phone
'The boy's talking on the phone'

The preposition al ha- 'on the' is used instead of the required ba- 'in the' with the noun 'telephone' in Hebrew.

(iv) hem nosim balul
they go travel in the chicken coop
'They're going in the chicken coop'

Here the stationary locative ba- 'in the' was misued instead of the movement towards prepositional la- or el ha- 'to the'.

This finding supports E. Clark's (1972) hypothesis that children are aware that words are related to each other as members of a particular semantic field.

I did not find any consistent preference for one preposition over another, that is, children did not substitute simpler terms for more complex terms as was suggested by E. Clark (1972). Only one subject (No. 15 MLU 3.5) produced the locative preposition al 'on' instead of the preposition al yad 'beside, next to,' quite consistently.

(14) (i) yešena al hadubi
sleeps (Fem) on the teddy
'(She) is sleeping on the teddy-bear'
instead of:
al yad hadubi
on hand the teddy
'beside the teddy'

(ii) omedet al hadelet
stands (Fem) on the door
'(She) is standing on the door'
instead of:
al yad hadelet
on hand the door
'beside the door'

It could be that al yad is more complex than al not only in terms of morphological complexity but also in terms of 'transparency' as is indicated by Johnston and Slobin (1977). There the researchers judged locative expressions to be easier whenever the form of the word gives some indication of its meaning. The locative al yad is misleading for the child because its literal meaning is 'on the hand of.' In fact there was in our sample one utterance that seems to clearly show this. In response to a picture of a bear and a child walking side by side the subject used al hayad 'on the hand' instead of al yad 'beside her.'

lama yes la dubi al hayad?
why has she a teddy on the hand
'Why does she have a teddy on her hand?

In their relative formal linguistic scale Johnston and Slobin (1977) considered morphological complexity as a possible determinant of order of acquisition. The Hebrew data clearly indicate that Hebrew speaking children do acquire one-morpheme locatives earlier than two- or three-morpheme locatives. It is striking that all the locative prepositions that were produced rarely and only by a few subjects with higher MLU values (see results, par. 7) have three morphemes.

As far as cognitive complexity is concerned, our data do support two of H. Clark's (1973) assumptions. (i) be- ba 'in' and al 'on' which are stationary locatives occur before el and le- of 'direction towards.'

(ii) le- 'to' and al 'on,' which refer to positive direction, are acquired before mi 'from' and mitaxat le- 'under,' which refer to negative direction.

Johnston and Slobin's (1977) proposal that linguistic processing might explain order of acquisition whenever the cognitive complexity fails to predict this order, seems justified. It might be that whenever the linguistic complexity is superimposed on the cognitive complexity level of a term, the end result is a significant delay in acquisition. The term 'under' is considered by most investigators to be more complex than 'in' and 'on' (Clark, 1972; Grieve et al., 1977), but still was found among the earliest adpositions to be acquired in English, Turkish, Serbo-Croatian and Italian (Johnston and Slobin, 1977). Although some of the stimuli pictures in our study included the spatial relation of 'under', only one child in our group produced the Hebrew term mitaxat le- 'under.' The child (subject No. 12 MLU 5.8) who had the highest MLU value in the group produced this preposition only once. It seems as though this finding manifests the significant role of morphological complexity in determining order of acquisition.

The present study suggests that the order of acquisition of locative prepositions in Hebrew is: be- ba- 'in'; le- la- and le- + pronominal suffixes 'to' (dative); al 'on'; le- la- 'to' (direction); mi- me- 'from'; al yad 'beside'; meaxorey 'behind'; mitaxat le- 'under.' It seems as though enclitic prefixed prepositions are acquired before full word prepositions that share the same locative notions. Our hypothesis that morphological complexity acts as a determinant in the acquisition of locative prepositions in Hebrew might be accepted. For more comprehensive conclusions further investigation is needed. It is suggested that Johnston and Slobin's structured methodology be replicated with Israeli subjects to have comparative data from another language. We also need an evaluation of the semantic complexity of the terms in Hebrew (lexical diversity in that specific semantic field), and to try to eliminate the semantic morpho-syntactic confounded variables. It is necessary also to investigate children's comprehension of these terms and to compare the data with the findings of this inquiry. It would be interesting to extend the study to older children at a more advanced level of language acquisition, when it is assumed that they have been acquired fairly complete control of the "fused" system of inflected preposition and pronominal suffixes.

Footnotes

1 I am extremely grateful to Dr. Melissa Bowerman, the Bureau of Child Research, University of Kansas, and Dr. Ruth Berman, Department of Linguistics, Tel Aviv University, Israel, for their valuable criticisms of the earlier drafts of this paper.

2 Hebrew forms are given in broad phonemic transcription. All words have main stress on the final syllable, unless they are specially marked with an accent aigu on the penultimate.

3 The method for calculating MLU in Hebrew was prepared under the guidance of Dr. Ruth Berman, Tel Aviv University. Although following the general lines for calculating MLU set out by Brown (1973), considerable modifications were necessary in view of the fact that Hebrew is much more highly inflected than English, and has a rich system of bound morphology. The MLU as stipulated in my earlier study was found to be a reliable indicator of overall language development, showing a high correlation with rate and stage of acquisition of various syntactic categories and markers (e.g. question-words, quantifiers, and adjectives).

4 Some differences between the use of locative prepositions in English and in Hebrew is manifested here. In Hebrew (not as in English) usually [- directional]prepositions would follow the verb sim 'put.' I considered the emphasis here on the end result of the action sim bakufsa in the sense of 'cause it to be in the box.'

5 For the purpose of this study, I included 'dative' among the locative prepositions for the following reasons: (i) Sometimes it was too difficult to distinguish between the two functions as Hebrew uses identical surface structures (le - 'to') for both. (ii) It seemed interesting to examine whether children acquire these two 'uses' concurrently or whether they apply a certain strategy which indcates that they distinguish between those two functions. (iii) It was argued in Lyons (1967:392) that "the case of the indirect object (the dative) and the directional of 'motion towards' fall together in many language."

References

Brown, R. 1973 A First Language: The Early Stages. Cambridge, Mass., Harvard University Press.

Clark, E. V. 1972 On the child's acquisition of antonyms in two different semantic fields. Journal of Verbal Learning and Verbal Behavior, 11.750-58.

_____. 1973 Non-linguistic strategies and the acquisition of word meanings. Cognition, 2.161-82.

Clark, H. H. 1973 Space, time, semantics and the child. In T. E. Moore (ed.), Cognitive Development and the Acquisition of Language. New York: Academic Press.

Clark, E. V. and Clark, H. H. 1977 Psychology and Language: An Introduction to Psycholinguistics. New York; Harcourt Brace Jovanovich, Inc.

de Villiers, J. G., de Villiers, P. A. 1973 A cross-sectional study of the acquisition of grammatical morphemes in child speech. Journal of Psycholinguistic Research, 2, 267-77.

Dromi, E. 1977 The MLU as a measure of language development in Hebrew speaking children aged 2-3. Master's dissertation, Tel Aviv Univ., School of Communication Disorders. (Unpublished).

Grieve, R., Hoogenraad, R., Murray, D. 1977 On the young child's use of lexis and syntax in understanding locative instructions. Cognition, 5, 235-50.

Grimm, H. 1975 On the child's acquisition of semantic structure underlying the world field of prepositions. Speech and Language, 18, 91-119.

Johnston, J. R. and Slobin, D. I. 1977 The development of locative expressions in English, Italian, Serbo-Croatian, and Turkish. Papers and Reports on Child Language Development, 134-147.

Lipp, E. 1977 The acquisition of Estonian inflections. Journal of Child Language, 4, 313-19.

Lyons, J. 1967 A note on possessive, existential and locative sentences. Foundations of Language, 3, 390-96.

Macwhinny, B. 1976. Hungarian research on the acquisition of morphology and syntax. Journal of Child Language, 13, 397-410.

Parisi, D. and Antinucci, F. 1970 Lexical competence. In Flores, D. and Levelt, (Eds.) Advances in Psycholinguistics, Amsterdam: North Holland.

Slobin, D. I. 1973 Cognitive prerequisites for the development of grammar. In C. A. Ferguson and D. I. Slobin, (Eds). Studies of Child Language Development. New York: Holt, Rinehart and Winston.